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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BOARD OF PATENT APPEALS AND INTERFERENCES	Application No.	09/138,926
	Filing Date	August 24, 1998
	First Named Inventor	Frank Cesare
	Group Art Unit	1772
	Examiner Name	S.M. Nolan-Rayford
	Confirmation No.	4707
	Attny. Dkt. No.	2431-102
Title of the Invention: LOW MOLECULAR WEIGHT POLYMERS AND THEIR USE AS DISPERSION AIDS		

SUBMISSION OF AMENDED APPEAL BRIEF

Director of the United States Patent
and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

This is in response to the November 15, 2005 Notification of Non-Compliant Appeal Brief. The Notification alleges that the Brief filed August 30, 2005 did not contain a statement of the status of all claims. To the contrary, the Brief as filed contained the following statement:

"STATUS OF CLAIMS

Claims 1-13 and 29 have been canceled. Claims 14-28 and 30-31 are all the remaining claims in the application, and on appeal."

Because applicant believed that the foregoing complied with 37 CFR §41.37(c)(1)(iii), Examiner Miggins was contacted for clarification. Examiner Miggins indicated that the statement quoted above did not indicate that claims 14-28 and 30-31 all stand currently rejected. While that is believed to be incorrect,¹ in order to advance the appeal, applicant submits herewith an Amended Appeal Brief that has been amended to specify that claims 14-28 and 30-31 are currently rejected.

If any fees are due in connection with this filing, the Commissioner is hereby authorized to charge the appropriate fees to Deposit Account Number 02-2135 in the name of Rothwell, Figg, Ernst & Manbeck.

Respectfully submitted,



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¹Because appeals are directed to rejected claims (37 CFR §41.31(a) and (c)), the statement that claims 14-28 and 30-31 are on appeal does indeed inform that those claims are rejected.



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	<i>Confirmation No.</i>	4707
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<i>Title of the Invention:</i> LOW MOLECULAR WEIGHT POLYMERS AND THEIR USE AS DISPERSION AIDS		

AMENDED APPEAL BRIEF

Director of the United States Patent
and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

This is an appeal from the March 20, 2005 final Office
Action rejecting claims 14-28 and 30-31 in the above-
identified application.

REAL PARTY IN INTEREST

The present application was assigned to Uniroyal
Chemical Company, Inc. That entity is now called Crompton
Manufacturing Company and is a subsidiary of Chemtura
Corporation.

RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences or judicial proceedings known to appellant, the appellant's legal representative, or the assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-13 and 29 have been canceled. Claims 14-28 and 30-31 all stand currently rejected, are all the remaining claims in the application, and are all the subject of the present appeal.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the March 30, 2005 final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to the use of low molecular weight polymers formed from monomers comprising ethylene, an alpha-olefin, and optionally a non-conjugated diene, to improve the dispersion of reinforcing agents into

high molecular weight polymers (specification, page 1, lines 15-19). Sole independent claim 14, reproduced in the Claims Appendix, recites a composition which comprises three components:

- a) a low molecular weight copolymer containing ethylene, an α -olefin such as propylene, and optionally a polyene, this component having a viscosity average molecular weight of from about 4,000 to about 30,000 and being a solid at room temperature;
- b) a reinforcing agent; and
- c) a high molecular weight polymer.¹

The presence of the low molecular weight material improves the dispersion of the reinforcing agent into the high molecular weight polymer.

The high molecular weight polymer includes both natural and synthetic rubber compounds (specification, page 5, line 29 to page 6, line 2). Suitable reinforcing agents include

¹ Appellant also presented claims to the low molecular weight polymer *per se* (original claims 1-13). Those claims were canceled by the September 21, 2004 Amendment in order to hasten issuance of claims 14-28, which were allowed in the March 24, 2004 Action, which was the *ninth* Action in this case. Instead of sending a Notice of Allowance, the Examiner, in the *tenth* Action in this case, withdrew the allowance of claims 14-28 and entered the present rejections based on references newly-cited by the Examiner.

aramid fibers, cotton, polyesters, fiberglass, etc.
(specification, page 6, lines 3-8). The reinforced high molecular weight polymers may be processed into, e.g., various types of reinforced belts, such as v-belts, timing belts, conveyor belts and drive belts; hoses; seals; diaphragms; cables; and roll covers (specification, page 5, line 29 to page 6, line 2).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1) Claims 14, 21-23 and 27 are rejected under 35 USC §102(b) as being anticipated by Liu (U.S. Patent No. 4,564,658).

2) Claims 14-28 and 30-31 are rejected under the judicially created doctrine of obviousness-type double patenting in view of claims 1 and 7 of U.S. Patent No. 4,843,128 ("the '128 patent"), in view of the English language abstract of JP 03268942A ("JP '942").

The present rejections described above are the latest in a tortured prosecution characterized by multiple instances of shifting rejections, an allowance of the present claims, then withdrawal of that allowance as a result of a new search by the Examiner, over six years after the case was filed. Claims 14-28 were originally filed on

August 24, 1998. The first Action (February 23, 2000) rejected those claims under the first and second paragraphs of 35 USC §112, and also under 35 USC §103 based on a number of references (Bushway, Frances, Gros, Allen and Oyama). On May 23, 2000, claim 14 was amended slightly, and it was argued that the rejections were defective. In the second Action (September 25, 2000), the Examiner withdrew all rejections of those claims, and entered another rejection under 35 USC §103 based only on Frances and Gros. On January 25, 2001 claim 14 was again amended in a minor respect, and it was argued that the new rejection was defective.

On April 10, 2001, the Examiner withdrew the pending rejection, and entered new rejections of claim 14 based on a new set of references (a Japanese abstract, an alleged admission in the specification, and Gros). On November 13, 2001, applicant presented arguments against the new rejections, without amending the claims. On December 31, 2001, the Examiner maintained the rejection of claim 14 based on a Japanese abstract in view of the alleged admission. On March 31, 2002 applicant argued, without amendment, that the rejection was untenable.

On May 24, 2002, the Examiner withdrew the prior art rejection, and entered a formalistic rejection under 35 USC §112, second paragraph. On August 24, 2002 applicant amended claim 14 slightly, and argued for the withdrawal of the rejection. On October 21, 2002 the Examiner withdrew the pending rejection, entered a *different* rejection under 35 USC §112, second paragraph (based on language that was in claim 14 since the application was filed in 1998), and entered a new obviousness rejection based on Frances and Allen (which, as shown above, had been applied in the first Action, but not since then). On December 6, 2002 applicant argued, without amendment, that the rejections were untenable.

On February 20, 2003 the Examiner withdrew all rejections, and entered a new rejection of claim 14 for lack of novelty over the U.S. equivalent to the previously-cited Allen EP patent. On July 21, 2003 applicant argued, without amendment, that the new rejection was untenable. On September 25, 2003 the Examiner withdrew the rejection, and ostensibly after a new search, entered yet another new rejection of claim 14, as being anticipated by Meynard, a new reference that had not been cited previously. On

December 29, 2003 applicant argued, without amendment, that the new rejection was untenable.

On March 24, 2004, the Examiner withdrew the rejection, and *allowed* claims 14-28. On September 21, 2004, in order to advance prosecution, applicant canceled the rejected claims (1-13 and 29), leaving the allowed claims as the only claims pending. On December 9, 2004, the Examiner withdrew the allowance of claims 14-28, and ostensibly after yet another new search, entered the rejections on appeal, relying on references that not been cited previously.²

²It is clear that claim 14 has been subject to multiple piecemeal examinations, contrary to the MPEP:

To bring the prosecution to as speedy conclusion as possible and at the same time to deal justly by both the applicant and the public, the invention as disclosed and claimed should be thoroughly searched in the first action and the references fully applied; and in reply to this action the applicant should amend with a view to avoiding all the grounds of rejection and objection. ***Switching from*** one subject matter to another in the claims presented by applicant in successive amendments, or from ***one set of references to another by the examiner in rejecting in successive actions claims of substantially the same subject matter, will alike tend to defeat attaining the goal of reaching a clearly defined issue for an early termination, i.e., either an allowance of the application or a final rejection.***

ARGUMENT

I. Liu Does Not Anticipate Claims 14, 21-23 and 27

Claims 14, 23 and 27

The final Action relies on Liu as disclosing a combination of a) a high molecular weight polyester; b) a glass fiber reinforcing agent; and c) an ethylene/propylene copolymer. However, Liu cannot anticipate claim 14, or any claim dependent therefrom. Present claim 14 recites that the low molecular weight copolymers have a viscosity average molecular weight of from about 4,000 to about 30,000. In contrast, Liu is silent as to the molecular weight of its copolymer. The final Action recognizes that defect, and alleges that the undisclosed limitation is inherently present in Liu (final Action at 3). However, that does not discharge the PTO's burden of showing that the prior art material necessarily contained that characteristic. The products may be similar, but the Examiner has not shown that they are identical or even substantially identical.

The Examiner relies on the fact that the Liu copolymer and the claim 14 copolymer have overlapping constituents (e.g., ethylene and propylene) and the same amounts to conclude that the molecular weights are the same. However, it has not been established that the amounts of the co-

monomers are the same. However, even if they were, the molecular weights of two materials containing the same constituents could vary widely, depending on well-known factors such as degree of polymerization, branching, cross-linking, etc. See, e.g., Liu at column 5, lines 30-36. The Examiner has failed to show that Liu inherently discloses the claimed molecular weight range.

Claim 21

This claim recites that the low molecular weight polymer has a viscosity average molecular weight of from about 5,000 to about 10,000. That range is not disclosed in Liu, therefore there is no anticipation.

Claim 22

This claim recites that the low molecular weight polymer yields about 10 mm or less in a needle penetration test. That characteristic is not disclosed in Liu, therefore there is no anticipation.

II. The Double Patenting Rejection Should be Reversed

Claims 14, 16, 21 and 23-28

The combination of references relied on in the double patenting rejection does not make out a *prima facie* case of obviousness of any of the rejected claims.

Claim 1 of the '128 patent recites a cured elastomeric composition comprising the following components:

- (A) between about 70 and about 94 phr of a highly unsaturated rubber;
- (B) between about 3 and about 27 phr of an ethylene/propylene/nonconjugated diene terpolymer having a number average molecular weight of more than about 35,000;
- (C) between about 3 and about 27 phr of a liquid ethylene/propylene/nonconjugated diene terpolymer having a number average molecular weight of between about 500 and about 15,000;
- (D) between about 2 and about 7.5 phr of a quinoline antidegradant; and
- (E) an effective amount of curative.

Acknowledging that claim 1 of the '128 patent does not suggest the use of reinforcing agents, the final Action

relies on JP '942 for its teaching that aramid fibers may be combined with chloroprene rubber.

The final Action relies on component (C) of claim 1 of the '128 patent as teaching the presently claimed ethylene/propylene copolymer component (*i.e.*, component (a) in present claim 14). In particular, the Action focuses on the disclosure of a number average molecular weight of 500-15,000. However, that material is expressly stated in claim 1 of the '128 patent to be a *liquid* ("between about 3 and about 27 phr of a *liquid* ethylene/propylene/nonconjugated diene terpolymer"), whereas the presently claimed low molecular weight material is a *solid* ("and being a *solid* at room temperature;" claim 14).

Recognizing that defect, the final Action attempts to supply the motivation for the substitution by interestingly arguing that it would be advantageous to use liquid dispersants instead of solid, because the use of heat could be avoided, citing the Liu patent, even though it does not form the basis for the rejection (final Action at 4). However, that argument does not provide the requisite motivation. Indeed, it teaches away from the invention of claim 14. By so arguing, the Examiner has confirmed that one of ordinary skill would *not* substitute the solid

material of claim 14 for the liquid material of the '128 patent, because of the perceived advantage of the liquid material.

The combination is further defective in failing to teach the presently-claimed amounts of the respective monomers in the low molecular weight polymer. It is well-established that it is the claims that are compared in assessing double patenting. *Ortho Pharmaceutical Co. v. Smith*, 959 F.2d 936, 22 USPQ2d 1119 (Fed. Cir. 1992). Present claim 14 recites that ethylene is present in an amount of from 67% to about 75% by weight; the polyene from about 0% to about 30% by weight; and the $\text{CH}_2=\text{CHQ}$ component from about 15% to about 40% by weight. In contrast, claim 1 of the '128 patent merely recites "an ethylene/propylene/non-conjugated diene terpolymer." Claims 1 and 7 of the '128 patent are silent as to the proportions of the monomers present, and thus cannot be viewed as suggesting the presently-claimed proportions. The abstract of JP '942 is no better, and cannot fill in that gap. The combination does not make out a *prima facie* case of obviousness.

The final Action recognizes that defect, but argues that the claims are nevertheless obvious because applicant

has not demonstrated that the claimed amounts give unexpected results (final Action at 4). That, however, puts the cart before the horse. Applicant is under no obligation to prove unexpected results where, as here, the PTO has failed to make out a *prima facie* case. Put another way, unexpected results may be evidence of nonobviousness, but are not a requirement. *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1461, 221 USPQ 481, 488 (Fed. Cir. 1984); *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1360-61, 220 USPQ 763, 771 (Fed. Cir. 1984). The rejection should be reversed.

Claim 15

This claim recites that the non-conjugated polyene is selected from the group consisting of 5-ethylidene-2-norbornene, 1,4-hexadiene and dicyclopentadiene. None of those polyenes is taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 17

This claim recites that the polyene component is present in an amount of from about 1% to about 20% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 18

This claim recites that the polyene component is present in an amount of from about 3% to about 15% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 19

This claim recites that the olefin component is present in an amount of from about 20% to about 35% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 20

This claim recites that the olefin component is present in an amount of from about 22% to about 30% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 22

This claim recites that the low molecular weight component yields about 10 mm or less in a needle penetration test. That characteristic is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 30

This claim recites that ethylene is present in the low molecular weight polymer in an amount of from about 71% to about 75% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

Claim 31

This claim recites that ethylene is present in the low molecular weight polymer in an amount of from 67% to 71% by weight. That range is not taught in claims 1 or 7 of the '128 patent, or in the abstract of JP '942. Therefore, the combination does not make out a *prima facie* case of obviousness with respect to this claim.

CONCLUSION

For the reasons stated, the rejections should be reversed.

Respectfully submitted,



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CLAIMS APPENDIX

14. A composition which comprises:

a) a polymer formed from monomers comprising ethylene; $\text{CH}_2=\text{CHQ}$ wherein Q is $\text{C}_1\text{-C}_8$ alkyl; and optionally a non-conjugated polyene; wherein

i) ethylene is present in an amount of from 67% to about 75% by weight;

ii) the polyene is present in an amount of from about 0% to about 30% by weight; and

iii) $\text{CH}_2=\text{CHQ}$ is present in an amount of from about 15% to about 40% by weight;

said polymer having a viscosity average molecular weight of from about 4,000 to about 30,000 and being a solid at room temperature, with the proviso that the sum of components i), ii) and iii) within said polymer totals 100% by weight;

b) a reinforcing agent; and

c) a high molecular weight polymer.

15. The composition of claim 14, wherein the non-conjugated polyene is selected from the group consisting of 5-ethylidene-2-norbornene, 1,4-hexadiene and dicyclopentadiene.

16. The composition of claim 15, wherein Q is methyl.

17. The composition of claim 16, wherein the polyene component is present in an amount of from about 1% to about 20% by weight.

18. The composition of claim 17, wherein the polyene component is present in an amount of from about 3% to about 15% by weight.

19. The composition of claim 14, wherein the $\text{CH}_2=\text{CHQ}$ component is present in an amount of from about 20% to about 35% by weight.

20. The composition of claim 19, wherein the $\text{CH}_2=\text{CHQ}$ component is present in an amount of from about 22% to about 30% by weight.

21. The composition of claim 14, wherein the polymer of part a) has a viscosity average molecular weight of from about 5,000 to about 10,000.

22. The composition of claim 14, wherein the polymer of part a) yields about 10 mm or less in a needle penetration test.

23. The composition of claim 14, wherein the reinforcing agent is selected from the group consisting of aramid fibers, cotton, polyesters, fiberglass, and mixtures thereof.

24. The composition of claim 23, wherein the reinforcing agent comprises aramid fibers.

25. The composition of claim 14, wherein the high molecular weight polymer is selected from the group consisting of natural rubber and synthetic rubber.

26. The composition of claim 25, wherein the synthetic rubber is selected from the group consisting of ethylene/alphaolefin/nonconjugated polyene (EPDM) rubbers, styrene/butadiene rubbers, acrylonitrile/butadiene (NBR) rubbers, polychloroprene and sulfur modified polychloroprene, and polybutadiene rubbers.

27. A moulded article made from the composition of claim 14.

28. The article of claim 27, wherein the article is selected from the group consisting of a v-belt, a timing belt, a conveyor belt, a drive belt, a hose, a seal, a diaphragm, a cable and a roll cover.

30. The composition of claim 14, wherein ethylene is present in an amount of from about 71% to about 75% by weight in the a) component polymer.

31. The composition of claim 14, wherein Q is methyl, and wherein ethylene is present in an amount of from 67% to 71% by weight in the a) component polymer.

EVIDENCE APPENDIX

Not applicable.

RELATED PROCEEDINGS APPENDIX

Not applicable.